

### ABSTRACT OF THE DISCLOSURE

An apparatus and method for calibrating a mass spectrometer by internally introducing calibration masses at a post-source stage of the mass spectrometer is provided. A source of lock mass ions adjacent the ion optics creates lock mass ions within the ion optics. Lock mass ions mix with the analyte ions in the ion optics prior to mass analysis. The source of lock mass ions may include various means for ionizing lock mass molecules including but not limited to photoionization, field desorption-ionization, electron ionization, and thermal ionization means. An apparatus and method of mass calibrating a tandem mass spectrometer is also provided. The mass calibration apparatus includes a collision cell for fragmenting analyte ions and a source of lock mass ions adjacent said collision cell for creating lock mass ions in the collision cell.

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